Answers

1 Yam Co

(a) The output capacity for each process is as follows:

The total processing hours of the factory is given but can be proven as follows:
18 hours x 5 days x 50 weeks x 50 production lines = 225,000 hours.

Given this, the production capacity for pressing must be 225,000 hours/0·5 hours per metre = 450,000 metres. Using this method the production capacity for all processes is as follows:

	Product A	Product B	Product C
Pressing	450,000	450,000	562,500
Stretching	900,000	562,500	900,000
Rolling	562,500	900,000	900,000

The bottleneck is clearly the pressing process which has a lower capacity for each product. The other processes will probably be slowed to ensure smooth processing.

Clearly an alternative approach is simply to look at the original table for processing speed and pick out the slowest process. This is pressing. (full marks available for that **explained** observation)

(b) TPAR for each product

	Product A	Product B	Product C
Selling price	70·0	60·0	27·0
Raw materials	3·0	2·5	1·8
Throughput	67·0	57·5	25·2
Throughput per bottleneck hour*	134·0	115·0	63·0
Fixed costs per hour (W1)	90·0	90·0	90·0
TPAR	1·49	1·28	0·7
Working*	67/0·5 = 134	57·5/0·5 = 115	25·2/0·4 = 63

W1 The fixed cost per bottleneck hour can be calculated as follows:
Total fixed costs are $18,000,000 plus the labour cost. Labour costs $10 per hour for each of the 225,000 processing hours, a cost of $2,250,000.

Total fixed cost is therefore $18,000,000 + $2,250,000 = $20,250,000

Fixed cost per bottleneck hours is $20,250,000/225,000 = $90 per hour

(c) **(i)** Yam could improve the TPAR of product C in various ways:

Speed up the bottleneck process. By increasing the speed of the bottleneck process the rate of throughput will also increase, generating a greater rate of income for Yam if the extra production can be sold. Automation might be used or a change in the detailed processes. Investment in new machinery can also help here but the cost of that would need to be taken into account.

Increase the selling prices. It can be difficult to increase selling prices in what we are told is a competitive market. Volume of sales could be lost leaving Yam with unsold stock or idle equipment. On the other hand, given the business appears to be selling all it can produce, then a price increase may be possible.

Reduce the material prices. Reducing material prices will increase the net throughput rate. Metal is available from many sources being far from a unique product. Given the industry is mature the suppliers of the raw material could be willing to negotiate on price; this could have volume or quality based conditions attached. Yam will have to be careful to protect its quality levels. Bulk buying increases stock levels and the cost of that would need to be considered.

Reduce the level of fixed costs. The fixed costs should be listed and targets for cost reduction be selected. ABC techniques can help to identify the cost drivers and with management these could be used to reduce activity levels and hence cost. Outsourcing, de-skilling or using alternative suppliers (for stationery for example) are all possible cost reduction methods.

(ii) A TPAR of less than one indicates that the rate at which product C generates throughput (sales revenue less material cost) is less than the rate at which Yam incurs fixed cost. So on a simple level, producing a product which incurs fixed cost faster than it generates throughput does not seem to make commercial sense. Clearly the TPAR could be improved (using the methods above) before cessation is considered any further.

However, cessation decisions involve consideration of many wider issues (only three required).

- Long-term expected net cash flows from the product allowing for the timing of those cash flows (NPV) are an important factor in cessation decisions
- Customer perception could be negative in that they will see a reduction in choice

- Lost related sales: if product C is lost will Yam lose customers that bought it along with another product?
- What use could be made of the excess capacity that is created
- Throughput assumes that all costs except raw materials are fixed; this may not necessarily be the case and only avoidable fixed costs need to be taken into account for a cessation decision. If few fixed costs can be avoided then product C is making a contribution that will be lost if the product ceased.

2 Oliver's Salon

(a) The average price for hairdressing per client is as follows:

2008: Female clients paid $200,000 for 8,000 visits. This is an average price per visit of $200,000/8,000 = $25.

In 2009 the female hairdressing prices did not increase and the mix of sales did not change so of the total revenue $170,000 (6,800 x $25) was from female clients. This means that the balance of $68,500 ($238,500 – $170,000) was from male clients at an average price of $20 per visit ($68,500/3,425).

(b) Financial performance assessment

Hairdressing sales growth: Oliver's Salon has grown significantly during the two years, with an increase of 19·25% (W1). This is impressive in a mature industry like hairdressing.

The increase has come from the launch of the new male hairdressing with a significant contraction in the core female business – down 15% (W1).

Hairdressing gross margin: Oliver's hairdressing overall gross margin has reduced significantly, down from 53% to 47·2% in 2009 (W2).

There has been an increase in staff numbers for the female part of the business and this, combined with the fall in the volume of sales from female clients, has significantly damaged margins from that customer type, with a fall from 53% to 40·5% (W2).

The margins from male clients in 2009 are 63·5% which is better than that achieved in 2008 from the female clients. This is probably mainly due to faster throughput, so that despite the lower average prices charged the overall margin was still quite good.

Staff costs: The staffing levels have had to increase to accommodate the new male market and the extra levels of business. The new hairdresser for the male clients is being paid slightly more than the previously employed staff (W3). This might encourage dissatisfaction. The addition of a junior will clearly reduce the overall **average** wage bill but increases costs overall whilst the volume of female clients is shrinking.

Advertising spend: This has increased by 150% in the year (W4). This is probably nothing to worry about as it is likely that the launching of the new product range (males!) will have required advertising. Indeed, given the increase in sales of male hair services it is fair to say that the money was well spent.

Rent is clearly a fixed cost and **administrative expenses** have gone up a mere 5·5%; these costs appear under control given the overall volume of clients is well up on 2008.

Electricity costs have jumped 14·3% which seems a lot but is probably a cost which Oliver would find hard to control. Energy companies are often very large organisations where competition is rarely significant. Small businesses have little choice but to pay the going rate for energy.

Net Profit: Overall net profit has worsened to 33·5% from 39% (W8). This is primarily due to the weakening gross margin and extra costs incurred for advertising. The advertising cost may not recur and so the net margin might improve next year.

Overall it is understandable that Oliver is disappointed with the financial results. With a 19·25% increase in overall sales he might have expected more net profit.

(c) Non-financial performance

Quality: The number of complaints is up by 283% (W5) and is proportionately more frequent. This seems to be due to two main reasons. Firstly the switch away from a single gender salon has upset the existing customer base. It is possible that by trying to appeal to more customer types Oliver is failing to meet the needs of at least one group. It may be that the quality of hair services has not worsened but that the complaints are regarding the change towards a multi-gender business.

Secondly the wage rates paid to the new junior staff seem to be well below the wage rates of the existing staff (W3). This implies that they are in training and could be of poorer quality. It is stated that they are in a supporting role but if not properly supervised then mistakes could easily occur. This can easily lead to complaints from dissatisfied customers.

Resource utilisation: The main resources that Oliver has are the staff and the rented property. As far as the property is concerned the asset is being used to a much higher degree with 27·8% more clients being serviced in the year (W6). However, as the overall margins are lower one might argue that just focusing solely on volume misses the point on asset utilisation.

As far as the staff usage is concerned it is a mixed scene. The female specialists are producing less per member of staff than in 2008 after the recruitment of one more staff member and a fall in volume of female clients. Each specialist served 2,000 female clients in 2008 and only 1,360 in 2009 (W9). Oliver may have been concerned with the complaints coming in and decided to do something about service levels by increasing resources for the female clients.

The specialist dealing with male clients has produced far more treatments than those serving the females. This is probably not unusual; we are told that the male customer requires only a simple service. Without comparative data we cannot say whether 3,425 customers per year is good. We also cannot say that this specialist is doing 'better' than the others. Cutting men's hair is quicker to do, so more output is inevitable.

Workings:

(W1) Sales growth overall is \$238,500/\$200,000 or +19·25%. The female hairdressing sales has though fallen by 15% (\$200,000 – \$170,000)/\$200,000. This is entirely reflected in volume as there was no price increase in 2009 for female clients.

(W2) Gross margin overall is \$106,000/\$200,000 or 53% in 2008 and \$112,500/238,500 or 47·2% in 2009.

This can be analysed between the female and male clients:

	2008		2009	
	Female \$	\$	Female \$	Male \$
Sales	200,000		170,000	68,500
Less cost of sales:				
Hairdressing staff costs (W3)	(65,000)		(74,000)	(17,000)
Hair products – female	(29,000)		(27,000)	
Hair products – male				(8,000)
Gross profit	106,000		69,000	43,500
GP%	53%		40·5%	63·5%

(W3) Staff cost growth is \$91,000/\$65,000 or +40%. In absolute terms average staff costs were \$65,000/4 = \$16,250 in 2008.

Additional staff cost \$26,000 (\$91,000 – \$65,000) in total for two people. The junior was paid \$9,000 and so the new specialist for the male customers must have been paid \$17,000

(W4) Advertising increased by \$5,000/\$2,000 or 150%

(W5) Number of complaints up by 46/12 or 283%. Complaints per customer visit up from 12/8,000 or 0·15% to 46/10,225 or 0·44%

(W6) Client growth is 10,225/8,000 or 27·8%

(W7) Number of female clients per specialist is 8,000/4 or 2,000 in 2008 and 6,800/5 or 1,360 in 2009. Number of male clients per specialist is 3,425 in 2009.

(W8) Net profit is \$78,000/200,000 or 39% in 2008 and \$80,000/238,500 or 33·5% in 2009.

3 Crumbly Cakes

(a) Production manager

Assessing the performance of the two managers is difficult in this situation. In a traditional sense the production manager has seriously over spent in March following the move to organic ingredients. He has a net adverse variance against his department of \$2,300 in one month. No adjustment to the standards has been made to allow for the change to organic.

The manager has not only bought organically he has also changed the mix, increasing the input proportion of the more expensive ingredients. This may have contributed to the increased sales of cakes.

However, the decision to go organic has seen the sales of the business improve. We are told that the taste of the cakes should be better and that customers could perceive a health benefit. However, the production manager is allocated none of the favourable sales variances that result. If we assume that the improved sales are entirely as a result of the production manager's decision to change the ingredients then the overall net favourable variance is \$7,700.

The production manager did appear to be operating within the original standard in February, indicating a well performing department. Indeed he will have earned a small bonus in that month.

Sales manager

A change to organic idea would need to be 'sold' to customers. It would presumably require a change of marketing and proper communication to customers. The sales manager would probably feel he has done a good job in March. It is debatable, however, whether he is entirely responsible for all of the favourable variances.

The move to organic certainly helped the sales manager as in February he seems to have failed to meet his targets.

Bonus scheme

The problem here is that the variances have to be allocated to one individual. The good sales variances have been allocated to the sales manager when in truth the production manager's decision to go organic appears to have been a good one and the driver of the business success. Responsibility accounting systems struggle to cope with 'joint' success stories, refuting in general a collective responsibility.

Under the current standards the production manager has seemingly no chance to make a bonus. The main problems appear to be the out-of-date standards and the fact that all sales variances are allocated to the sales manager, despite the root cause of the improved performance being at least in part the production manager's decision to go organic. The system does not appear fair.

General comments

It would appear that some sharing of the total variances is appropriate. This would be an inexact science and some negotiation would be needed.

One problem seems to be that the original standards were not changed following the decision to go organic. In this sense the variances reported are not really 'fair'. Standards should reflect achievable current targets and this is not the case here.

(b) Variance calculations

Material price variances

Ingredient	Act price/kg	Std price/kg	Actual quantity kg	(AP – SP) x AQ MPV	Adv or Fav
Flour	0·13	0·12	5,700	57	Adv
Eggs	0·85	0·70	6,600	990	Adv
Butter	1·80	1·70	6,600	660	Adv
Sugar	0·60	0·50	4,578	458	Adv
Total				2,165	Adv

Material mix variance

Ingredient	Act mix	Std mix	Std price	Variance	Adv or Fav
Flour	5,700	5,870	0·12	–20	
Eggs	6,600	5,870	0·70	511	
Butter	6,600	5,870	1·70	1,241	
Sugar	4,578	5,870	0·50	–646	
Totals	23,478	23,478		1,086	Adv

Material yield variance

Actual yield	60,000 cakes
Standard yield (23,478/0·4)	58,695 cakes
Difference	1,305 cakes
Standard cost of a cake (W1)	$0·302
Yield variance (1,305 * 0·302)	394 Fav

Sales price variance

	Act price	Std Price	Act volume	(AP – SP) * Act Vol Variance	Adv or Fav
Cake	0·99	0·85	60,000	8,400	Fav

Sales volume contribution variance

Actual volume	60,000 cakes
Budget volume	50,000 cakes
Standard contribution	0·35
Variance (60,000 – 50,000) * 0·35 =	$3,500 Fav

W1

Standard cost of a cake

Ingredients	Kg	$	Cost
Flour	0·10	$0·12 per kg	0·012
Eggs	0·10	$0·70 per kg	0·070
Butter	0·10	$1·70 per kg	0·170
Sugar	0·10	$0·50 per kg	0·050
Total input	0·40		0·302
Normal loss (10%)	(0·04)		
Standard weight/cost of a cake	0·36		0·302

4 Bits and Pieces

(a) The decision to open on Sundays is to be based on incremental revenue and incremental costs:

	Ref	$	$
Incremental revenue	W1		800,000
Incremental costs			
– Cost of sales	W2	335,000	
– Staff	W3	45,000	
– Lighting	W4	9,000	
– Heating	W5	9,000	
– Manager's bonus	W6	8,000	
– Total			406,000
Net incremental revenue			394,000

Conclusion

On the basis of the above it is clear that the incremental revenue exceeds the incremental costs and therefore it is financially justifiable.

(W1) Incremental revenue

Day	Sales $	Gross profit %	Gross profit $	Cost of Sales $
Average	10,000	70%		
Sunday (+60% of average)	16,000	50%	8,000	8,000
Annually (50 days)	800,000		400,000	400,000
Current results (300 days)	3,000,000	70·0%	2,100,000	
New results	3,800,000	65·8%	2,500,000	

(W2) Purchasing and discount on purchasing
Extra purchasing from Sunday trading is $800,000 – $400,000 = $400,000

Current annual purchasing is $18,000 x 50 =$900,000

New annual purchasing is ($900,000 + $400,000) x 0·95 = $1,235,000

Incremental cost is $1,235,000 – $900,000 = $335,000 (a $65,000 discount)

(W3) Staff costs
Staff costs on a Sunday are 5 staff x 6 hours x $20 per hour x 1·5 = $900 per day
Annual cost is $900 x 50 days = $45,000

(W4) Lighting costs
Lighting costs are 6 hours x $30 per hour x 50 days = $9,000

(W5) Heating costs
Heating cost in winter is 8 hours x $45 per hour x 25 days = $9,000

(W6) Manager's bonus
This is based on the incremental revenue $800,000 x 1% = $8,000 (or $160 per day)

(b) The manager's rewards can be summarised as follows:

Time off
This appears far from generous. The other staff are being paid time and a half and yet the manager does not appear to have this option and also is only being given time off in lieu (TOIL) at normal rates. Some managers may want their time back as TOIL so as to spend time with family or social friends; others may want the cash to spend. One would have thought some flexibility would have been sensible if the manager is to be motivated properly.

Bonus
The bonus can be calculated at $8,000 per annum (W6); on a day worked basis, this is $160 per day. This is less than that being paid to normal staff; at time and a half they earn 6 hours x $20 x 1·5 = $180 per day. It is very unlikely to be enough to keep the presumably better qualified manager happy. Indeed the bonus is dependent on the level of new sales and so there is an element of risk involved for the manager. Generally speaking higher risk for lower returns is far from motivating.

The level of sales could of course be much bigger than is currently predicted. However, given the uplift on normal average daily sales is already +60%, this is unlikely to be significant.

(c) **Discounts and promotion**

When new products or in this case opening times are launched then some form of market stimulant is often necessary. B&P has chosen to offer substantial discounts and promotions. There are various issues here:

Changing buying patterns: It is possible that customers might delay a purchase a day or two in order to buy on a Sunday. This would cost the business since the margin earned on Sunday is predicted to be 20% points lower than on other days.

Complaints: Customers that have already bought an item on another day might complain when they see the same product on sale for much less when they come back in for something else on a Sunday. Businesses need to be strong in this regard in that they have to retain control over their pricing policy. Studies have shown that only a small proportion of people will actually complain in this situation. More might not, though, be caught out twice and hence will change the timing of purchases (as above).

Quality: The price of an item can say something about its quality. Low prices tend to suggest poor quality and *vice versa*. B&P should be careful so as not to suggest that lower prices do not damage the reputation of the business as regards quality.

5 Northland

(a) Overhead costs for the 2010 budget:

Property cost = $120,000 x 1·05 = $126,000
Central wages = ($150,000 x 1·03) + $12,000 = $166,500
Stationery = $25,000 x 0·6 = $15,000

(b) The road repair budget will be based on 2,200 metres of road repairs; it is common to include a contingency in case roads unexpectedly need repair (see part (c)).

The weather conditions could add an extra cost to the budget if poor or bad conditions exist. The adjustment needed is based on an expected value calculation:

(0·7 x 0%) + (0·1 x 10%) + (0·2 x 25%) = 6%

Hence the budget (after allowing for a 5% inflation adjustment) will be:

2,200 x $15,000 x 1·06 x 1·05 = $36,729,000

This could be shown as:

(2,200 x 15,000 x 1·0 x 0·7) + (2,200 x 15,000 x 1·1 x 0·1) + (2,200 x 15,000 x 1·25 x 0·2) = $34,980,000

The $34,980,000 could then be adjusted for inflation at 5% to give $36,729,000 as above.

(c) An expected value calculation used in budgeting has the following problems associated with it:

- It is often difficult to estimate the probabilities associated with different (in this case) weather conditions. The weather in one year may not reflect the weather in the following year leading to wildly inaccurate estimates and hence budgeting errors.
- It is difficult to estimate the precise monetary value attaching to each of the outcomes. 'Bad' weather can presumably take many forms (extreme cold, heat or water); the effect of each of these could be difficult to assess. Whilst using expected values it is common to group the events together and have one probability estimate. This may prove inadequate or inaccurate.
- The expected value that is calculated might not reflect the true cost leading to over or under spends on budget.
- The managers will have an easy fallback position should the budgets turn out to be incorrect. It would probably be accepted that the weather (and hence the probability of it) is outside their control and over spends could not then be blamed on them.

A contingency is often added to a budget in the event that there is uncertainty on the likely spend. In this case there would be much uncertainty over the level and indeed type of road repairs required. Roads could be damaged by weather conditions (extreme cold or heat) or unexpected land movements (earthquakes). Public safety could be at risk meaning that a repair is essential. This could result in a higher spend.

Equally the type of repair needed would vary and be unpredictable. Small holes might be simply filled in but larger holes or cracks might involve repairs to the foundations of the road. The costs could differ considerably between the different types of repairs.

(d) Zero based budgeting involves three main steps:

- **Define decision packages.** These are detailed descriptions of the activities to be carried out. There will be some standardisation within the data to allow comparison with other activities (costs, time taken and so on). A cost-benefit analysis is often carried out at this stage to ensure the most cost effective and beneficial approach to the activity is taken.
- **Evaluation and ranking of activities.** Each activity is assessed; those that are perhaps part of a legal obligation become 'must do' activities; others may be viewed as discretionary. The LGO will have to decide which of the activities offer the greatest value for money (VFM) or the greatest benefit for the lowest cost.
- **Allocation of resource.** The budget will then be created for the accepted activities.

Fundamentals Level – Skills Module, Paper F5
Performance Management **June 2009 Marking Scheme**

				Marks	*Marks*
1	**(a)**	Identification of bottleneck		1	
		Explanation		2	
					3
	(b)	Sales prices (per product)		0·5	
		Raw material cost (per product)		0·5	
		Throughput per bottleneck hour (per product)		0·5	
		Fixed costs		1·5	
		Fixed cost per hour		0·5	
		TPAR (per product)		0·5	
					8
	(c)	**(i)**	Increase speed of bottleneck	1	
			Increase selling prices – difficult to do	1	
			Reduce material prices	1	
			Reduce level of fixed costs	1	
					4
		(ii)	Explain a TPAR	2	
			Long-term cash flows	1	
			Lost related sales	1	
			Use of spare capacity	1	
			Fixed costs	1	
			Any other reasonable factor e.g. lost contribution	1	
			Maximum		5
			Total		20
2	**(a)**	Average price for female customers		1	
		Average price for male customers		2	
					3
	(b)	Sales growth		2	
		Gross margin		2	
		Rent		1	
		Advertising spend		2	
		Staff costs		2	
		Electricity		1	
		Overall comment		1	
					11
	(c)	Quality – single gender		1·5	
		Quality – wage levels		1·5	
		Quality – other		1·5	
		Resource utilisation – property		1	
		Resource utilisation – staff		2	
		Resource utilisation – other		1·5	
		Maximum			6
		Total			20

			Marks	*Marks*
3	**(a)**	Production manager assessment	2	
		Sales manager assessment	2	
		Bonus scheme comment	3	
				7
	(b)	Price variance	3	
		Mix variance	3	
		Yield variance	3	
		Sales price variance	2	
		Sales volume variance	2	
				13
		Total		20
4	**(a)**	Existing total sales	1	
		New sales	1	
		Incremental sales	1	
		Existing purchasing	1	
		Discount allowed for	1	
		Incremental Sunday purchasing costs	1	
		Staff cost	1	
		Lighting cost	1	
		Heating cost	1	
		Manager's bonus	1	
		Maximum		12
	(b)	Time off at normal rate not time and a half	1	
		Lack of flexibility	1	
		Bonus per day worked calculation and comment	1	
		Risk	1	
				4
	(c)	Changing customer buying pattern	2	
		Complaints risk	2	
		Quality link	2	
		Maximum		4
		Total		20

			Marks	*Marks*
5	**(a)**	Property cost	1	
		Central wages	1	
		Stationery	1	
				3
	(b)	Basic budget	2	
		Contingency included	2	
		Expected value adjustment	2	
				6
	(c)	Probability estimates difficult	1	
		Monetary values uncertain	1	
		EV not an actual value	1	
		Easy fall back for managers	1	
		Contingency		
		Uncertainty issue	1	
		Weather	1	
		Other outside influences	1	
		Type of repairs variable	1	
				8
	(d)	Explanation of ZBB process	3	
				3
		Total		20